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In Reply Refer To:
AESO/SE
22410-2008-F-0215

March 1, 2010

Mr. Chris Knopp, Forest Supervisor
Apache Sitgreaves National Forests
P.O. Box 640
Springerville, Arizona 85938-0640

RE: Four Bridge Project Biological Opinion

Dear Mr. Knopp:

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated February 17, 2009, and received by us on February 19, 2009. At issue are impacts that may result from the proposed Four Bridge Project located in Greenlee County, Arizona. Your biological assessment and evaluation (BAE) concluded that the proposed project "may affect, and is likely to adversely affect" the loach minnow (*Tiaroga cobitis*) and its critical habitat and Chiricahua leopard frog (*Lithobates chiricahuensis*) (CLF). You also concluded that the project "may affect, but is not likely to adversely affect" the Mexican spotted owl (*Strix occidentalis lucida*) and its critical habitat and Apache trout (*Oncorhynchus apache*). You also stated that the proposed action "is not likely to jeopardize" the continued existence of the Mexican gray wolf (*Canis lupus baileyi*). We concur with your determinations for the Mexican spotted owl and its critical habitat, Apache trout, and Mexican gray wolf, and our reasoning is provided in Appendix A.

This biological opinion (BO) is based on information provided in the BAE, additional information received via email (with attachment) on March 23, 2009, telephone conversations and emails with my staff and wildlife biologist Linda WhiteTrifaro of your staff, and other sources of information. Literature cited in this BO is not a complete bibliography of all literature available on the species of concern, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

CONSULTATION HISTORY

- February 19, 2009: We received a February 17, 2009, letter from the Apache-Sitgreaves National Forest (ASNF) requesting formal consultation of the Four Bridge Project.

- March 23, 2009: We received an email from ASNF documenting a change in their determination for CLF from "not likely to adversely affect" to "likely to adversely affect".

- April 3, 2009: We acknowledged the ASNF's February 17, 2009, request for formal consultation via letter.

- August 17, 2009: We sent a request for a 60-day extension to ASNF.

- December 21, 2009: We sent the draft BO to ASNF for review and comment.

- February 2, 2010: We received comments on the draft BO from ASNF.

- February 22, 2010: We sent the revised draft BO to ASNF via email.

- February 22, 2010: We received an email from ASNF accepting the edits to the draft BO.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

To ensure bridge safety and public health, the Alpine Ranger District proposes to take actions to mitigate the potential for water scour on the abutments and piers of four bridges by placing rock riprap against four bridge substructures in the East Fork Black River (EFBR) and Black River. The bridges and location are listed in Table 1 below.

Table 1. Bridge Names and Location

Bridge Name	Location Forest Road (FR)
Diamond Rock	East Fork Black River (FR 276)
Three Forks	East Fork Black River (FR 249)
Buffalo Crossing	East Fork Black River (FR 24)
Wildcat Crossing	Black River (FR 25)

Initially, large rocks weighing approximately 500 to 5000 pounds (lbs) would be stockpiled next to the river at each bridge site to minimize time required for rock placement into the river. The streamside, stockpiled rock would then be placed against the bridge substructures by an approximately 50,000 lb. track excavator which would operate within the active channel. Rock placement would be on the upstream point of the substructure, but it would also be placed along

the sides. The rock would be laid on the existing streambed, tiered at an approximate 2:1 slope against the substructure, to a level that is expected to protect the substructure at bankfull discharge[1].

To ensure proper rock riprap placement, work would occur under low flow conditions during the fall, between October and November. The total estimated stream disturbance area required at each bridge locations is as follows: 2,530 square feet (ft ^{2}) at Diamond Rock, 4,410 ft ^{2} at Three Forks, 5,490 ft ^{2} at Buffalo Crossing, and 13,120 ft ^{2} at Wildcat Crossing (see Appendix B, Figure 1). In order to be in a position to properly place rock, it is expected that the excavator would need approximately one day of work time per each abutment and each pier. Total days for just within-water work would be approximately 17 days (see Table 2 below); however, additional time may be needed depending on weather and any other unforeseen conditions.

Table 2. Estimated cubic yards of riprap required for each pier/abutment and schedule for in-stream construction.

Bridge Name	Rock riprap amount	# Piers	# Abutments	Estimated days for rock placement by excavator per bridge *
Diamond Rock	50 cubic yards	1	2	3
Three Forks	100 cubic yards	2	2	4
Buffalo Crossing	100 cubic yards	2	2	4
Wildcat Crossing	150 cubic yards	4	2	6

*An additional 1-3 days may be required to stockpile rock at each bridge site.

The following Best Management Practices (BMPs) are part of the proposed action and apply to the entry of equipment into the floodplain and into the river:

- The only materials placed within the wetted channel will be clean rock material.
- Before entering the floodplain and water, equipment will be free of dirt and clean of fluids.
- Vehicles and equipment shall be inspected for leaks by the operator each day of use; leaks shall be repaired immediately, otherwise, problem vehicles or equipment shall be removed from the project areas.
- Equipment fueling shall take place on level grade areas protected from water run-on and run-off and shall be located no less than 100 feet from the edge of any floodplain (fuel tanks shall not be “topped off”).
- Equipment stored overnight or longer shall take place on level grade areas protected from water run-on and run-off and shall be located no less than 100 feet from the edge of any floodplain.

[1] Bankfull discharge represents a measure of interaction between the stream and its adjacent valley bottom; thus, it strongly influences the geomorphic and biological characteristics of the riparian environment (USDI 1998).

- Drip pans or absorbent pads shall be used during vehicle and equipment fueling and absorbent spill clean-up materials and spill kits shall be available at fuel sites and on fuel trucks.

- Fuels and lubricants shall not be dumped onto the ground but shall be removed promptly and disposal of used oils, fluids and lubricants shall be according to state approved methods.

- Spills shall not be hosed or buried, and used absorbent materials shall be removed promptly and disposed of according to state approved methods.

Implementation of the proposed action is expected to initiate between the months of October through November 2009 and, depending on weather or other unforeseeable events, may be extended to 2010 and 2011.

STATUS OF THE SPECIES

Chiricahua Leopard Frog

The CLF was listed as a threatened species without critical habitat in a Federal Register notice dated June 13, 2002. The frog is distinguished from other members of the *Lithobates pipiens* complex by a combination of characteristics, including a distinctive pattern on the rear of the thigh consisting of small, raised, cream-colored spots or tubercles on a dark background; dorsolateral folds that are interrupted and deflected medially; stocky body proportions; relatively rough skin on the back and sides; and often green coloration on the head and back (Platz and Mecham 1979). The species also has a distinctive call consisting of a relatively long snore of one to two seconds in duration (Davidson 1996, Platz and Mecham 1979). Snout-vent lengths of adults range from approximately 2.1 to 5.4 inches (Stebbins 2003, Platz and Mecham 1979).

The CLF is an inhabitant of cienegas, pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 3,281 to 8,890 feet in central and southeastern Arizona; west-central and southwestern New Mexico; and in Mexico, northeastern Sonora, the Sierra Madre Occidental of northwestern and west-central Chihuahua, and possibly as far south as northern Durango (Platz and Mecham 1984, Degenhardt et al. 1996, Sredl et al. 1997, Sredl and Jennings 2005). Reports of the species from the State of Aguascalientes (Diaz and Diaz 1997) are questionable. The distribution of the species in Mexico is unclear due to limited survey work and the presence of closely related taxa (especially *Lithobates lemosespinali*) in the southern part of the range of the CLF. In Arizona, slightly more than half of all known historical localities are natural lotic systems, a little less than half are stock tanks, and the remainder are lakes and reservoirs (Sredl et al. 1997). Sixty-three percent of populations extant in Arizona from 1993 to 1996 were found in stock tanks (Sredl and Saylor 1998).

Die-offs of CLFs were first noted in former habitats of the Tarahumara frog (*Lithobates tarahumarae*) in Arizona at Sycamore Canyon in the Pajarito Mountains (1974) and Gardner Canyon in the Santa Rita Mountains (1977 to 1978) (Hale and May 1983). From 1983 to 1987, Clarkson and Rorabaugh (1989) found CLFs at only two of 36 Arizona localities that had supported the species in the 1960s and 1970s. Two new populations were reported. During subsequent extensive surveys from 1994 to 2001, the CLF was found at 87 sites in Arizona,

including 21 northern localities and 66 southern localities (Sredl et al. 1997, Rosen et al. 1996, Service files). In New Mexico, the species was found at 41 sites from 1994 to 1999; 31 of those were verified extant during 1998 to 1999 (Painter 2000). During May-August 2000, the CLF was found extant at only eight of 34 sites where the species occurred in New Mexico during 1994 to 1999 (C. Painter, pers. comm. 2000). As of 2008, 80 sites were known to be occupied by CLFs in Arizona, at least 34 of which were breeding sites. In New Mexico, 15-23 breeding sites were known in 2008; the frogs occur at additional dispersal sites. The species has been extirpated from about 80 percent of its historical localities in Arizona and New Mexico. Nineteen and eight localities are known from Sonora and Chihuahua, respectively; however, the status of the species in Mexico is poorly understood.

Threats to this species include predation by non-native organisms (especially bullfrogs, fishes, and crayfish), disease, drought, floods, mining, development, disruption of metapopulation dynamics, increased chance of extirpation or extinction resulting from small numbers of populations and individuals, environmental contamination, and other human activities; degradation and loss of habitat as a result of water diversions, groundwater pumping, poor livestock management; and altered fire regimes due to fire suppression and livestock grazing. Loss of CLF populations is part of a pattern of global amphibian decline, suggesting other regional or global causes of decline may be important as well (Carey et al. 2001). Witte et al. (2008) analyzed risk factors associated with disappearances of ranid frogs in Arizona and found that population loss was more common at higher elevations and in areas where other ranid population disappearances occurred. Disappearances were also more likely where introduced crayfish occur, but were less likely in areas close to a source population of frogs.

Numerous studies indicate that declines and extirpations of CLFs are at least in part caused by predation and possibly competition by non-native organisms, including fishes in the family Centrarchidae (*Micropterus* spp., *Lepomis* spp.), bullfrogs (*Lithobates catesbeianus*), tiger salamanders (*Ambystoma mavortium mavortium*), crayfish (*Orconectes virilis* and possibly others), and several other species of fishes (Clarkson and Rorabaugh 1989; Sredl and Howland 1994; Fernandez and Bagnara 1995; Snyder et al. 1996; Rosen et al. 1996, 1994; Fernandez and Rosen 1996, 1998). For instance, in the Chiricahua Mountain region of southeastern Arizona, Rosen et al. (1996) found that almost all perennial waters investigated that lacked introduced predatory vertebrates supported CLFs. All waters except three that supported introduced vertebrate predators lacked CLFs. Sredl and Howland (1994) noted that CLFs were nearly always absent from sites supporting bullfrogs and non-native predatory fish. Rosen et al. (1996) suggested further study was needed to evaluate the effects of mosquitofish (*Gambusia sp.*), trout (*Salmo sp.*), and catfish (*Ictalurus sp.*) on frog presence.

Disruption of metapopulation dynamics is likely an important factor in regional loss of populations (Sredl et al. 1997, Sredl and Howland 1994). CLF populations are often small and habitats are dynamic, resulting in a relatively low probability of long-term population persistence. Historically, populations were more numerous and closer together. If populations were extirpated due to drought, disease, or other causes, those sites could be recolonized via immigration from nearby populations. However, as numbers of populations declined, populations became more isolated and were less likely to be recolonized if extirpation occurred. Also, most of the larger source populations along major rivers and in cienega complexes have disappeared.

Recent evidence suggests a chytridiomycete skin fungi, *Batrachochytrium dendrobatidis* (*Bd*), is responsible for global declines of frogs, toads, and salamanders (Speare and Berger 2000, Longcore et al. 1999, Berger et al. 1998, Hale 2001). In Arizona, *Bd* infections have been reported from several populations of CLFs in southeastern Arizona, as well as populations of several other frogs and toads (Morell 1999, Sredl and Caldwell 2000, Davidson et al. 2000, Hale 2001, Bradley et al. 2002, U.S. Fish and Wildlife Service 2007a).

The spread of *Bd* could be influenced by tourists or fieldworkers sampling aquatic habitats (Halliday 1998). The fungus can exist in water or mud and thus could be spread by wet or muddy boots, vehicles, cattle, and other animals moving among aquatic sites, or during scientific sampling of fish, amphibians, or other aquatic organisms. The FWS and Arizona Game and Fish Department (AGFD) are employing preventative measures to ensure the disease is not spread by aquatic sampling.

An understanding of the dispersal abilities of CLFs is key to determining the likelihood that suitable habitats will be colonized from a nearby extant population of frogs. In Arizona, there is evidence of substantial dispersal. Movement may occur via movement of frogs or passive movement of tadpoles along streamcourses. Several studies of CLF movement document CLF immigration up to five miles or more (R. Jennings, C. Painter, pers. comm. 2004; Frost and Bagnara 1977; Rosen and Schwalbe 1998; Rosen et al. 1996). Movements away from water do not appear to be random. Streams are important dispersal corridors for young northern leopard frogs (Seburn et al. 1997). Displaced northern leopard frogs will return through the apparent use of olfactory and auditory cues, and possibly celestial orientation, as guides (Dole 1968, 1972). Rainfall or humidity may be an important factor in dispersal because odors carry well in moist air, making it easier for frogs to find other wetland sites (Sinsch 1991). Based on these studies, the CLF recovery plan (U.S. Fish and Wildlife Service 2007a) provides a rule of thumb on dispersal capabilities. CLFs are assumed to be able to disperse one mile overland, three miles along ephemeral drainages, and five miles along perennial water courses.

A recovery plan has been completed (U.S. Fish and Wildlife Service 2007a), the goal of which is to improve the status of the species to the point that it no longer needs the protection of the Act. The recovery strategy calls for reducing threats to existing populations; maintaining, restoring, and creating habitat that will be managed in the long term; translocating frogs to establish, reestablish, or augment populations; building support for the recovery effort through outreach and education; monitoring; research needed to provide effective conservation and recovery; and application of research and monitoring through adaptive management. Recovery actions are recommended in each of eight recovery units throughout the range of the species. Management areas are also identified within recovery units where the potential for successful recovery actions is greatest.

Additional information about the CLF can be found in Painter (2000), Sredl et al. (1997), Jennings (1995), Degenhardt et al. (1996), Rosen et al. (1996, 1994), Sredl and Howland (1994), Platz and Mecham (1984, 1979), Sredl and Jennings (2005), and U.S. Fish and Wildlife Service (2007a).

Loach Minnow

Loach minnow was listed as a threatened species on October 28, 1986 (USFWS 1986). Critical habitat was designated on March 21, 2007 (USFWS 2007b). In Arizona, the current designation includes portions of the Black River, East Fork Black River (EFBR), North Fork East Fork Black River, and Boneyard Creek; Aravaipa Creek and its tributaries Deer and Turkey creeks; the San Francisco River, Eagle Creek, and the Blue River and its tributaries, Campbell Blue Creek and Little Blue Creek. In New Mexico, the current designation includes portions of the Blue River; the San Francisco River and its tributary Whitewater Creek; the Tularosa River and its tributary, Negrito Creek; Campbell Blue Creek; Dry Blue Creek and its tributaries Frieborn and Pace creeks; the Gila River, including portions of its West, Middle, and East forks. Designated critical habitat was voluntarily remanded by the FWS in 2008 but remains in place until redesignation in 2011.

Loach minnow is a small fish from the minnow family Cyprinidae. Loach minnow are olivaceous in color, and highly blotched with darker spots. Whitish spots are present at the front and back edges of the dorsal fin, and on the dorsal and ventral edges of the caudal fin. A black spot is usually present at the base of the caudal fin. Breeding males have bright red-orange coloration at the bases of the paired fins and on the adjacent body, on the base of the caudal lobe, and often on the abdomen. Breeding females are usually yellowish on the fins and lower body (Minckley 1973, USFWS 1991).

Loach minnow are endemic to the Gila River basin of Arizona and New Mexico within the United States, and Sonora, Mexico, where they were recorded only in the Rio San Pedro. Historically, loach minnow in Arizona were found in the Salt River mainstem near and above the Phoenix area, the White River, East Fork White River, Verde River, Gila River, San Pedro River, Aravaipa Creek, San Francisco River, Blue River, and Eagle Creek, as well as some tributaries of these streams. In New Mexico, loach minnow historically occupied the Gila River including its West, Middle, and east Forks, the San Francisco River, the Tularosa River, and Dry Blue Creek (Minckley 1973, Minckley 1985).

Loach minnow are bottom-dwelling inhabitants of shallow, swift water over gravel, cobble, and rubble substrates (Rinne 1989, Propst and Bestgen 1991). Loach minnow use the spaces between, and in the lee of, larger substrate for resting and spawning (Propst et al. 1988, Rinne 1989). The loach minnow is rare or absent from habitats where fine sediments fill the interstitial spaces (Propst and Bestgen 1991). Some studies have indicated that the presence of filamentous algae may be an important component of loach minnow habitat (Barber and Minckley 1966). Loach minnow feeds exclusively on aquatic insects (Schrieber 1978, Abarca 1987). Loach minnow live two to three years with reproduction occurring primarily in the second summer of life (Minckley 1973, Sublette et al. 1990). Spawning occurs March through May (Britt 1982, Propst et al. 1988); however, under certain circumstances loach minnow also spawn in the autumn (Vives and Minckley 1990). The eggs of loach minnow are attached to the underside of a rock that forms the roof of a small cavity in the substrate on the downstream side. Limited data indicate that the male loach minnow may guard the nest during incubation (Propst et al. 1988, Vives and Minckley 1990).

The limited taxonomic and genetic data available for loach minnow indicate there are substantial differences in morphology and genetic makeup between remnant loach minnow populations.

Tibbets (1993) concluded that results from mitochondrial DNA (mtDNA) and allozyme surveys indicate variation for loach minnow follows drainage patterns, suggesting little gene flow among rivers. The levels of divergence present in the data set indicated that populations within rivers are unique, and represent evolutionarily independent lineages. The main difference between the mtDNA and allozyme data was that mtDNA suggest that the San Francisco/Blue and Gila groups of loach minnow are separate, while the allozyme data places the Gila group within the San Francisco/Blue group. Tibbets (1993) concluded that the level of divergence in both allozyme and mtDNA data indicated that all three main populations (Aravaipa Creek, Blue/San Francisco Rivers, and Gila River) were historically isolated and represent evolutionarily distinct lineages.

Critical habitat

Critical habitat for loach minnow includes approximately 522 river miles in Arizona and New Mexico, organized into four complexes. The four complexes are: the Black River complex in Apache and Greenlee counties, Arizona; the Middle Gila/Lower San Pedro/Aravaipa Creek River complex in Pinal and Graham counties, Arizona; the San Francisco and Blue Rivers complex in Pinal and Graham counties, Arizona, and Catron County, New Mexico; and the Upper Gila River Complex in Catron, Grant, and Hidalgo counties, New Mexico.

The critical habitat designation listed primary constituent elements that are essential for the conservation of loach minnow. The primary constituent elements are summarized below:

1. Permanent, flowing, water with low levels of pollutants.

2. Sand, gravel, and cobble substrates with low or moderate amounts of fine sediment and substrate embeddedness. Suitable levels of embeddedness are generally maintained by a natural, unregulated hydrograph that allows for periodic flooding or, if flows are modified or regulated, a hydrograph that allows for adequate river functions, such as flows capable of transporting sediments.

3. Streams that have low gradients, water temperatures between 35-85 Fahrenheit, pool, riffle, run, and backwater components, and an abundant aquatic insect food base.

4. Habitat devoid of nonnative fish species detrimental to loach minnow or habitat in which detrimental nonnative fish species are at levels which allow persistence of loach minnow.

5. Areas within perennial, interrupted stream courses which are periodically dewatered but that serve as connective corridors between occupied or seasonally occupied habitat and through which the species may move when the habitat is wetted.

The appropriate and desirable level of these factors may vary seasonally and is highly influenced by site-specific circumstances. Therefore, assessment of the presence/absence, level, or value of the constituent elements must include consideration of the season of concern and the characteristics of the specific location. The constituent elements are not independent of each other and must be assessed holistically, as a functioning system, rather than individually. In addition, the constituent elements need to be assessed in relation to larger habitat factors, such as watershed, floodplain, and streambank conditions, stream channel geomorphology, riparian vegetation, hydrologic patterns, and overall aquatic faunal community structure.

Both historical and present landscapes surrounding loach minnow habitats have been impacted to varying degrees by the introduction of non-native aquatic species, domestic livestock grazing, mining, agriculture, timber harvest, recreation, development, or impoundments (Hendrickson and Minckley 1984, Belsky et al. 1999). These activities degrade loach minnow habitats by altering flow regimes, increasing watershed and channel erosion and thus sedimentation, and adding contaminants to streams and rivers (Belsky et al. 1999). As a result, these activities may affect loach minnow through direct mortality, interference with reproduction, and reduction of invertebrate food supplies. Our information indicates that, approximately 275 consultations have been completed or are underway for actions affecting loach minnow. The majority of these opinions concerned the effects of grazing, roads and bridges, or agency planning. Additional consultations dealt with timber harvest, fire, flooding, recreation, realty, animal stocking, water development, recovery (including loach minnow reintroduction efforts), and water quality issues.

The status of loach minnow is declining rangewide. Although it is currently listed as threatened, the FWS determined in 1994 that a petition to uplist the species to endangered status is warranted (USFWS 1994). The FWS confirmed this decision in 2000 (USFWS 2000). A reclassification proposal is pending. However, work on this decision is precluded due to work on other higher priority listing actions (USFWS 1994).

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

The action area includes the footprint of the project area including the location of all four bridges, rock riprap stockpile locations, and the impact area of construction equipment. Indirect effects included within the action area would extend from the existing road adjacent to each bridge, across the floodplain, into the streambed itself, and downstream for the length of generated sediment flow. Specifically how far the total action area would extend during implementation or thereafter is not known.

Chiricahua leopard frog

The Three Forks Crossing bridge is located within the vicinity of the Three Forks CLF population. A pond associated with the Three Forks area is a primary breeding site for the frogs and until recently provided a reliable source for a captive rearing and release program implemented by the AGFD. This site is located near the EFBR where suitable habitat still occurs and impacts of bridge construction are expected to occur. Refer to the Forest's BAE for more specific locations and site description. No other populations are known to occur within suitable dispersal distance of the action area. CLFs have not been found at Three Forks since 2006, despite multiple surveys, and may be absent (Jim Rorabaugh, FWS, pers. comm. 2009). Predation from crayfish is likely a limiting factor in the recruitment and success of this population. Recent surveys in the upper EFBR in 2007, 2008, and 2009 (Carter 2007, Robinson et al. 2008, Crowder 2009), detected speckled dace, desert sucker, Sonora sucker, and brown

trout. Apache trout were stocked in the EFBR in 1996 and more recently in 2008. Introduced Apache trout and non-native trout likely prey upon larval frogs and limit recruitment in the EFBR. Another possible factor is the watershed impacts from the 2004 Three Forks Fire (see discussion below), which could have contributed to their decline.

Loach minnow

Within the action area loach minnow and its critical habitat occur within portions of the EFBR. Documentation of loach minnow within the EFBR has significantly decreased from 41 individuals found in 1996 (Marsh 1997). In 2000, AGFD surveyed lower Coyote Creek where one loach minnow was found and an unidentified number (plural, number not specified) on the North Fork at three locations (M. Lopez, AGFD, pers. comm. 2000). Between July 5 and 9, 2004, attempted salvage operations post-Three Forks Wildfire concluded with two loach minnow (S. Gurtin, AGFD, pers. comm. 2004). The last three attempts (2007, 2008, and 2009) to find loach minnow in the EFBR system were unsuccessful. Survey dates were recorded as follows: August 28-30, 2007 in the EFBR (Carter 2007), July and August 2008 (Robinson et. al. 2008), and July 2009 (C. Crowder, AGFD, pers. comm. 2009).

The decrease in the loach minnow population is likely attributed to the presence of non-native and possibly native trout within the EFBR. Robinson et al. (2008) found four brook trout, four rainbow trout, one cutthroat trout, and one Apache trout in the occupied loach minnow habitat. The effects of trout in the EFBR likely include competition or predation by the trout on the loach minnow. Apache trout are not highly piscivorous (Behnke 2002, Clarkson and Dreyer 1996) although small fish may be eaten opportunistically. Rainbow trout have been documented feeding on loach minnow (Propst et al. 1998). Trout are stocked within the EFBR during the period when loach minnow would be spawning, so there is opportunity for predation on young-of-year fish.

Effects to critical habitat in the EFBR would be from the Apache trout and rainbow trout being stocked into the designated reach. Documentation of stocked species in the critical habitat area affects primary constituent element 4: habitat devoid of nonnative aquatic species or habitat in which nonnative aquatic species are at levels that allow persistence of loach minnow (USFWS 2007a). Another possible factor is the watershed impacts from the 2004 Three Forks Fire (see discussion below), which could have contributed to their decline.

Both Species

The following effects of past and present impacts discussed below contribute to the status of CLF and loach minnow and its critical habitat.

The Three Forks Crossing, Diamond Rock Crossing, and Buffalo Crossing (bridges) are located along the EFBR. The final bridge, Wildcat Crossing, is situated on the Black River. The floodplain and river habitat at all locations are affected by Forest Roads (FR) 249, 276, 24, and 25. Impacts from these roads within the action area are dust and runoff. The stream, streambank, and floodplain in the Diamond Rock Bridge vicinity are also affected by heavy recreational foot traffic which likely contributes to runoff within the action area.

Within the Three Forks bridge area watershed impacts have occurred from fire, suppression, (including hand lines, dozer lines, wildfire, burnout operations, and retardant application) and Burn Area Emergency Rehabilitation (including seeding, mulching, and dozer line and hand line rehabilitation) activities associated with the 2004 Three Forks wildfire. Formal emergency

consultation was initiated for this fire; however, the effects have not yet been evaluated or summarized in a formal opinion.

Electroshocking surveys for loach minnow, initiated by the AGFD were completed above and below the Three Forks bridge in 2007, 2008, and 2009 (Carter 2007, Robinson et al. 2008, Crowder 2009). The ASNF also issued a special use permit to the University of Arizona for research in the vicinity of the confluence of the East Fork and West Fork Black River. Seining and electroshocking for Desert and Sonoran suckers were initiated and concluded in the summer of 2007.

Current grazing decisions within the action area of the four bridges exclude livestock grazing in riparian and floodplain areas. Grazing does take place adjacent to the EFBR for two weeks every other year, approximately one mile upstream of the Buffalo Crossing bridge. No livestock grazing is authorized in the vicinity of the Diamond Rock bridge. In our February 28, 2002, biological opinion we concluded incidental take for loach minnow was not anticipated to occur as a result of grazing actions.

The aggregate impacts of the wildfire, suppression actions, livestock grazing, fish surveys, and recreation activities as described above all contribute to the present status of the CLF and loach minnow and its critical habitat in the action area.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

Chiricahua Leopard Frog

The effects to CLF from the proposed action include the streamside stockpiling of large rocks (between 500 to 5,000 lbs), the placement of large rocks against two piers and two abutments (associated with the Three Forks bridge) within the stream channel, and operation of the approximately 50,000 lb. excavator within and outside of the EFBR. The proposed action is expected to occur in October and November during low flow stream conditions.

Soil compaction from construction equipment and large rocks could have adverse effects to frogs hibernating during winter months in the vicinity of the Three Forks bridge. The Recovery Plan (USFWS 2007b) states that CLFs likely overwinter at or near breeding sites, although microsites for these “hibernacula” have not been studied. In general, documentation of CLF hibernating along stream banks or within the stream itself has not been recorded. However, based on studies of other leopard frogs, they probably stay at the bottom of ponds that are relatively well-oxygenated. This would include pools along stream courses. It is also possible they may sit in wet places or holes or rock crevices along banklines that are either submerged or otherwise stay wet through the winter (Jim Rorabaugh, FWS, pers. comm. 2009).

The CLF habitat at the Three Forks population is known as a complex breeding site with springs and a pond that lie adjacent to the EFBR. The pond is the primary breeding site for this location with the surrounding areas providing diverse microsites for all stages of the CLF. Construction activities will occur (October through November) when frogs are less active and/or hibernating. The primary concern is for frogs that may be hibernating within the substrate surrounding the Three Forks bridge at the time of construction. If frogs overwinter in these microsites, more specifically the staging area and construction footprint surrounding the Three Forks bridge, they could be crushed from large rocks and the track excavator. Due to the weight of the equipment and boulders, any entrapment as a result of soil/substrate compaction would result in frog mortality.

Surveys within the immediate Three Forks area have not found CLF since 2006. There are not enough survey data to conclude the action area is unoccupied because a thorough survey of the Three Forks area (including the springs, pond, and EFBR) has not occurred and it is possible a few adult frogs remain within the area. In addition, several factors including the presence of non-natives, the construction timeframe (approximately four to seven days), and season (fall) when frogs are less active and/or hibernating, limits the potential for adverse effects to CLF. Because of these uncertainties, we cannot be reasonably certain CLFs will be injured or killed by the proposed action.

Loach Minnow

The Three Forks, Diamond Rock, and Buffalo Crossing bridges are all located along the EFBR. All survey information records above previously documented loach minnow within the Three Forks area. Loach minnow occur within the watershed but they have not been recorded in the areas of the Diamond Rock and Buffalo Crossing bridges. Although loach minnow have not been observed in the Three Forks area since 2005, and because suitable un-surveyed habitat remains in the vicinity of the other two bridges, these areas are still considered occupied. All three bridges are located within the EFBR area designated as loach minnow critical habitat.

The effects to loach minnow and its critical habitat from the proposed action include the placement of large rocks against five piers and six abutments (associated with all three bridges) within the stream channel, operation of the excavator within and outside of the EFBR, and any sediment generated from construction activities and rock placement within the river. Timing of the proposed action is expected to occur between October and November during low flow stream conditions.

The timing of construction operations limit the possibility of the proposed actions from affecting spawning loach minnow (March through May) and egg/fry that would be utilizing the interstitial spaces within the impact areas. As indicated by Propst et al. (1988) and Rinne (1989) loach minnow use the spaces between, and in the lee of, larger substrate for spawning. These spaces are also used throughout the year for cover and protection. Direct effects from construction operations between October and November are anticipated to adversely affect loach minnow utilizing the habitat where the construction equipment and the placement of large rocks at all three bridges are expected to occur. These effects are likely to result in mortality of loach minnow within the impact areas, as well as result in loss of habitat.

Loach minnow may be adversely affected by increased sediment deposition on the stream bottom at and downstream of the bridge abutments. Adverse effects of stream sedimentation to fish and fish habitat have been documented (Murphy et al. 1981, Wood et al. 1990, Newcombe and MacDonald 1991, Barret 1992, Megahan et al. 1992). Because of their benthic habit, loach minnow are vulnerable to substrate sedimentation. The use of the excavator along the bank of and within the EFBR is likely to result in substrate sedimentation during and post construction. Physical habitat alteration or disturbance associated with construction equipment and the placement of large rocks within the active channel of the three bridge locations is likely to occur. However, the area of direct effects will be localized and limited to the impact area surrounding the three bridges and the immediate downstream areas.

Loach Minnow Critical Habitat

The impacts from construction equipment and large rocks within the EFBR will result in direct effects to primary constituent element one. This primary constituent element describes the importance of living areas for adult, juvenile, and larval loach minnow and spawning areas with appropriate water levels, flows, and substrates. The weight of construction equipment and large rocks within the river will contribute to the compaction and disruption of suitable spawning habitat for loach minnow. In addition, the soil compaction and disturbance within the river will likely adversely affect the low or moderate amounts of fine sediment and substrate embeddedness downstream of the three bridges. Although the construction areas are localized these impacts will adversely affect primary constituent elements one and two.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this BO. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Future non-Federal activities within the action area that are reasonably certain to occur and which could impact CLF and loach minnow include: privately managed campgrounds and associated maintenance. The Diamond Rock and Buffalo Crossing bridges are among campgrounds along the East Fork Black River. The campgrounds are managed by a private concessionaire under special use permit that specifies activities authorized and issued by the ASNF (e.g., toilet and campfire ring cleaning, trash collection, fees, etc.). These activities associated with the operation of the camping facilities near Diamond Rock and Buffalo Crossing bridges may reduce the quality and quantity of CLF and loach minnow habitat and therefore contribute as cumulative effect to the proposed action.

CONCLUSION

After reviewing the current status of the CLF and loach minnow and its critical habitat, the environmental baseline for the action area, the effects of the proposed Four Bridge Project and the cumulative effects, it is the FWS's BO that the Four Bridge Project, as proposed, is not likely to jeopardize the continued existence of the CLF and loach minnow, and is not likely to destroy or adversely modify designated loach minnow critical habitat.

We note that this BO does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat. In particular, herein we describe how the proposed action would affect those physical or biological features that are essential to the conservation and recovery of the species, and whether such effects rise to the level of destruction or adverse modification.
We present this conclusion for the following reason:

Chiricahua leopard frog

- Survey data are lacking, but we anticipate that frogs where present, are present in low numbers. In addition, the impacts surrounding the Three Forks Bridge will occur when frog dispersal is limited and frogs are potentially hibernating. These facts, combined with the limited time frame of the proposed action of approximately seven days of construction activities within and near the EFBR lead us to conclude that the proposed action will not eliminate the population or jeopardize the species as a whole.

Loach minnow and its critical habitat

- Access to the Three Forks, Diamond Rock, and Buffalo Crossing bridges will require work within the EFBR but outside of the loach minnow spawning season. While adults and habitat may be affected, we believe the estimated total of 11 days of work within the river is not likely to jeopardize the population or species as a whole.

- The effects to critical habitat within the EFBR are limited to the impact areas surrounding and downstream of all three bridges. The proposed action will have direct impacts to habitat surrounding the three bridges and indirect effects downstream. Primary constituent elements one and two for loach minnow critical habitat will be affected. However, recovery potential for the species in the EFBR will not be compromised by the proposed action.

- The BMPs described above will help limit the potential impacts to loach minnow.

The conclusions of this BO are based on full implementation of the project as described in the Description of the Proposed Action section of this document, including any BMPs that were incorporated into the proposed action.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined (50 CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. " Harass" is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not

intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

AMOUNT OR EXTENT OF TAKE

Chiricahua leopard frog
While frogs may be present, we anticipate that they are present in low numbers. The overall footprint of the action is small, and the project is of short duration. We believe that the proposed action will occur at a limited time and place, and are therefore unable to conclude with reasonable certainty that the proposed action will result in incidental take of CLFs.

Loach minnow
Take in the forms of harm and/or harassment resulting in habitat modification and injury or death of loach minnow is reasonably certain to occur, as explained in the effects of the action. However, we anticipate incidental take of loach minnow will be difficult to detect for the following reasons:

- The low numbers of loach minnow within the EFBR make it difficult to determine that take will occur from construction operations.

- Dead or impaired individuals are difficult to find due to their small size and the likelihood for carcasses to be carried downstream or scavenged.

Therefore, we cannot quantify the amount of direct take that will occur from an excavator and large rocks associated with this proposed action.

Because incidental take of loach minnow will be difficult to detect, we describe incidental take in terms of impacts from the proposed action, and use surrogate measures to identify when take has been exceeded. We anticipate that take will occur at each of the three bridges including habitat downstream within the EFBR because: 1) cavities between cobble in which loach minnow seek shelter will be compressed; 2) cavities between cobbles in areas downstream of excavator crossings will be filled with sediment that becomes entrained in the water column following construction; and 3) loach minnow present in the stream at the time of bridge construction may be crushed and their habitat disturbed, resulting in temporary displacement that is disruptive to their ability to feed and find adequate shelter.

Incidental take is associated with three bridge locations and will include approximately 11 days of work in the EFBR. At Three Forks Bridge, we anticipate impacts, as described above, to occur over 4,410 ft^2. At Diamond Rock Bridge, we anticipate impacts, as described above, to occur over 2,530 ft^2. At Buffalo Crossing Bridge, we anticipate impacts, as described above, to occur over 5,490 ft^2. Take will be considered to have been exceeded if any additional occupied loach minnow habitat is disturbed through compaction or sedimentation during implementation of the proposed action.

REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

Chiricahua leopard frog
No incidental take is anticipated for this species, therefore, no reasonable and prudent measures or terms and conditions for CLF are included in this incidental take statement.

Loach minnow
The following reasonable and prudent measures and terms and conditions are necessary and appropriate to minimize take of loach minnow:

1. The ASNF shall ensure habitat impacts are kept to a minimum by completing the following:

    a. The construction footprint as determined by the project design will be flagged upstream and downstream to show the extent of allowable work area at each bridge site.
    b. Photo points (quadrats) will be established before work begins and photos taken at the end of each work day to ensure that no additional habitat damage outside the allowable area has occurred.

2. The ASNF shall ensure water quality impacts are kept to a minimum.

    a. Any leaks or spills detected from construction equipment or fueling areas shall be repaired as outlined in the BMPs for this project.

Disposition of Dead or Injured Listed Species

Upon locating a dead, injured, or sick listed species initial notification must be made to the FWS's Law Enforcement Office, 2450 W. Broadway Rd, Suite 113, Mesa, Arizona, 85202, telephone: 480/967-7900) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible state.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

Chiricahua leopard frog

We recommend that ASNF: a) survey suitable habitat and potential dispersal habitat within the Three Forks area; b) identify measures to reduce or eliminate crayfish; and c) work with us to augment frogs at Three Forks.

Loach Minnow

We recommend that ASNF monitor loach minnow occupancy and habitat within the EFBR, within and downstream of all three bridge locations, in order to determine the long-term suitability for loach minnow and its habitat. In addition, blocknetting downstream of each bridge site during the construction periods of use might facilitate an understanding of fish mortality caused by bridge construction.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We appreciate your efforts to identify and minimize effects to listed species from this project. For further information, please contact Ryan Gordon (x225) or Mary Richardson (x242). We also encourage the ASNF to coordinate this project with the AGFD.

Please refer to the consultation number 22410-2008-F-0215 in future correspondence concerning this project.

Sincerely,

/s/ Debra Bills for Steven L. Spangle
Field Supervisor

cc: District Ranger, Alpine Ranger District, Alpine, AZ
Forest Biologist, Alpine Ranger District, Alpine, AZ (Attn: Linda WhiteTrifaro)
Jim Rorabaugh, Fish and Wildlife Service, Tucson, AZ (electronic copy)
Mary Richardson, Fish and Wildlife Service, Phoenix, AZ (electronic copy)

Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ

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APPENDIX A

Appendix A documents our concurrence with your determination of "may affect, is not likely to adversely affect" for the following species and critical habitats.

Mexican Spotted Owl

1. Noise from construction operations adjacent to Wildcat Crossing Bridge will occur between October and November outside of the Mexican spotted owl (MSO) breeding season. Wildcat Crossing Bridge is located on the boundary and is situated between two MSO protected activity centers (PACs) (McKibbons Pond and Wildcat Point). Therefore, based on the timing, duration of the proposed action (see Table 2), and the location of construction operations associated with these two PACS, disturbance from construction operations is not likely to adversely affect MSO.

2. All other PACs are located approximately 0.5 mile or greater from Diamond Rock, Three Forks, and Buffalo Crossing bridges; therefore, disturbance from construction operations is not likely to adversely affect MSO.

3. Construction operations at all four bridge locations will not modify any restricted, protected or designated critical habitat acres for the Mexican spotted owl.

Apache Trout

1. The potential for pure Apache trout to escape from the Fish Creek barrier are limited to flood events or barrier failure. Although low numbers of Apache trout could escape and travel downstream to the Wildcat Crossing Bridge; we cannot meaningfully measure, detect, or evaluate the impacts.

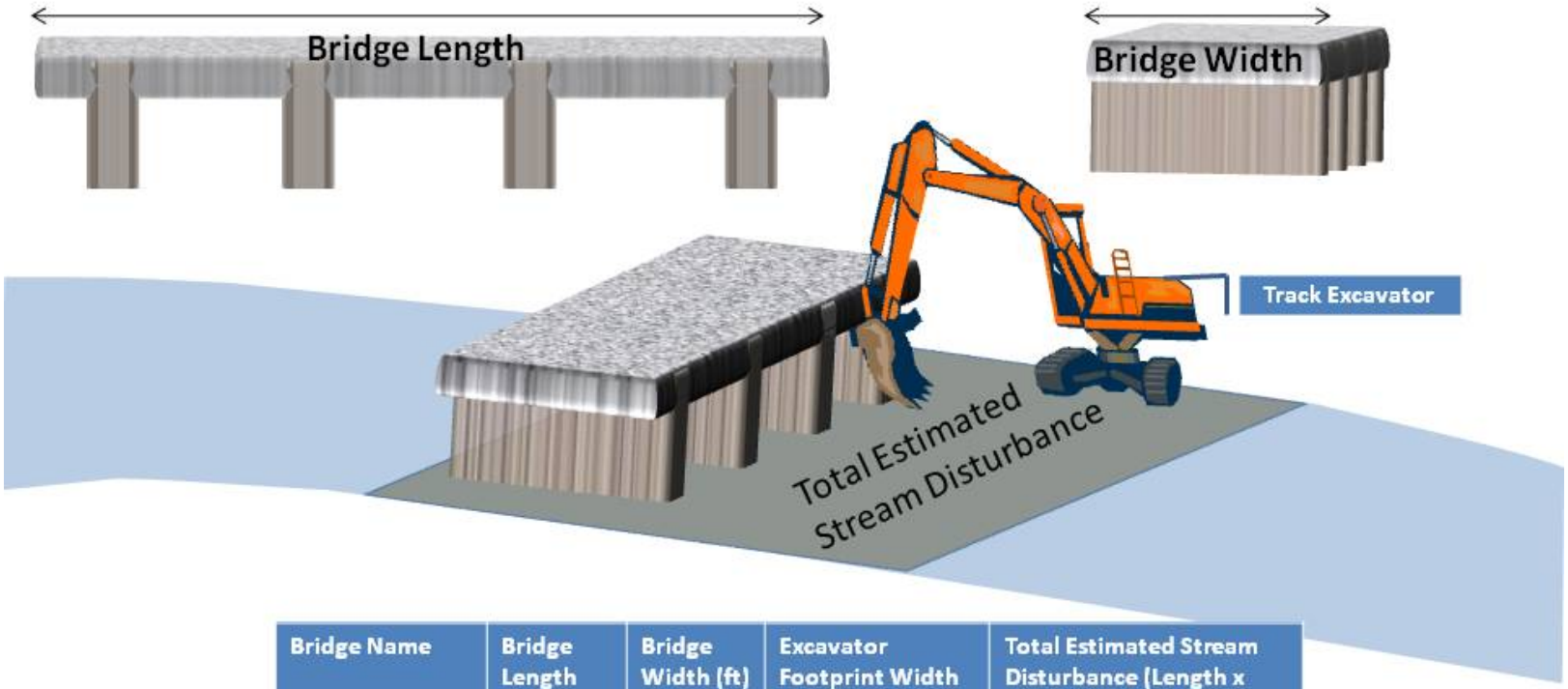
2. Apache trout are stocked into the East Fork from Buffalo Crossing upstream to Diamond Rock to provide put-and-take fishing opportunities. Because stocked Apache trout are not part of the recovery populations any additional loss from construction activities is insignificant and will not impact the species survival and recovery.

Mexican gray wolf

1. Because of the wolves' status as an experimental, non-essential population, wolves found in Arizona are treated as though they are proposed for listing for section 7 consultation purposes. By definition, an experimental non-essential population is not essential to the continued existence of the species. Thus, no proposed action impacting a population so designated could lead to a jeopardy determination for the entire species.

APPENDIX B

Figure 1



Bridge Name	Bridge Length (ft)	Bridge Width (ft)	Excavator Footprint Width (ft)	Total Estimated Stream Disturbance (Length x Total Width = ft²)
Buffalo Crossing	90	31	30	5490
Diamond Rock	55	16	30	2530
Three Forks	45	52	46	4410
Wildcat Crossing	160	30	52	13120